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FINAL REPORT

Report Prepared by: Lorene L. Rogers

Date: 6 July 1954  
For Period 15 June 1949 to  
14 May 1954

NR: 120-906

CONTRACT: No. N9onr-93900

ANNUAL RATE: \$4,500.00

CONTRACTOR: The University of Texas, Austin, Texas

PRINCIPAL INVESTIGATOR: Roger J. Williams, Professor of  
Chemistry; Director, Biochemical  
Institute, The University of Texas

TITLE OF PROJECT: Research on Metabolic Traits in Relation  
to Alcoholism and Mental Disease.

Objectives: The accumulation of data which would contribute  
to the determination of the etiology of alcoholism,  
mental disease, feeble-mindedness, and obesity.  
Such information would in turn be used in efforts  
to develop schemes for predicting susceptibility  
of an individual to these conditions.

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ABSTRACT OF RESULTS:

Contract N9onr -93900 was initially awarded to the Contractor for the purpose of gaining "an acquaintance with the individual metabolic patterns which people possess and to classify and relate these patterns to the incidence of alcoholism and mental disease." An extended outline of the background and basis for this work was given in the original application, and a request was made for a sum of \$44,090.00 for this work. The amount awarded by the contract was \$4,500.00 for the period 15 June 1949 - 14 May 1950. A like amount has been granted each succeeding year, the final period being 15 May 1953 - 14 May 1954. Because of the limited funds available from this contract, they were used as supplementary to other funds received from other sources for similar purposes.

The urine, blood, saliva, phagocytic indices, and taste thresholds of alcoholics and non-alcoholics were studied over a period of one month. A considerable number of the items studied in the alcoholics seemed to be highly distinctive for this group. The data seem to indicate strongly that alcoholism has a fundamental physiological basis. (This work is reported in the first publication listed below.) A similar study has since been carried out on twenty-six alcoholics and twenty-six non-alcoholic controls, and this material is now being readied for publication. A more extended study is in the planning stage, and an effort will be made to determine once and for all whether there is a typical metabolic pattern for alcoholics and whether such a pattern is a cause or an effect of the disease.

More than sixty metabolic factors have been studied in more than forty individuals, of whom a portion were healthy subjects and the remainder either mental patients, compulsive drinkers, feeble-minded children, or overweight or underweight individuals. In the process of this work a number of new experimental techniques were developed. Details of these techniques, as well as detailed data obtained from this study, are reported in publications 2 - 23 listed below.

A compilation has been made of all data on metabolic patterns collected in this laboratory. Urinary excretion data for nearly four hundred men, women, and children have been summarized and distribution curves and percentile ranks have been prepared. This study is reported in paper 24.

Work is still in progress on the isolation and identification of a growth factor which has shown some evidence of being involved in alcohol consumption. Also the study on blood levels of eleven

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constituents in several individuals is not yet complete.

We are now preparing for publication a series of papers which will be combined under the title Biochemical Institute Studies VI and which will include some of the data accumulated during the period of this grant. We shall be happy to distribute copies of this volume to you when it is published.

#### REPORTS AND PUBLICATIONS:

1. Beerstecher, Ernest, Jr., Sutton, H. Eldon, Berry, Helen Kirby, Brown, William Duane, Reed, Janet, Rich, Gene B., Berry, L. Joe and Williams, Roger J., Biochemical Individuality. V. Explorations with Respect to the Metabolic Patterns of Compulsive Drinkers, Archives of Biochemistry, 29, 27-40 (1950)
2. Williams, Roger J., Introduction, General Discussion and Tentative Conclusions, The University of Texas Publication, 5109, 7-21 (1951)
3. Berry, Helen Kirby, Sutton, Harry Eldon, Cain, Louise and Berry, Jim S., Development of Paper Chromatography for Use in the Study of Metabolic Patterns, The University of Texas Publication, 5109, 22-55 (1951)
4. Jirgensons, B., The Influence of Solvent Composition, Temperature and Some other Factors on the Rf Values of Amino Acids in Paper Chromatography, The University of Texas Publication, 5109, 56-70 (1951)
5. Berry, Helen Kirby and Cain, Louise, Quantitative Study of Urinary and Salivary Amino Acids Using Paper Chromatography, The University of Texas Publication, 5109, 71-76 (1951)
6. Cain, Louise and Berry, Helen Kirby, The Quantitative Determination of Histidine Using Paper Chromatography, The University of Texas Publication, 5109, 77-79 (1951)
7. Berry, Helen Kirby and Cain, Louise, The Quantitative Determination of Creatinine in Urine Using Paper Chromatography, The University of Texas Publication, 5109, 80-81 (1951)
8. Cain, Louise, The Quantitative Determination of Creatine in Urine by Paper Chromatography, The University of Texas Publication, 5109, 82-83 (1951)
9. Berry, Helen Kirby, The Quantitative Estimation of Uric Acid by Paper Chromatographic Methods, with Applications to Human Urine and Saliva, The University of Texas Publication, 5109, 84-87 (1951)

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10. Berry, Helen Kirby, The Quantitative Estimation of Urea by Paper Chromatographic Methods with Applications to Human Urine, The University of Texas Publication, 5109, 88-92 (1951)
11. Sutton, Harry Eldon, A Micro Determination of Sodium Using Paper Chromatography, The University of Texas Publication, 5109, 93-96 (1951)
12. Bloch, Eric, Beerstecher, Ernest, Jr., Thompson, Roy C., Quantitative Study of Ketosteroids by Paper Chromatographic Methods with Applications to Human Urine, The University of Texas Publication, 5109, 97-108 (1951)
13. Sutton, Harry Eldon and Beerstecher, Ernest, Jr., The Determination of Ferric Chloride Chromogens in Human Urine by Paper Chromatographic Methods, The University of Texas Publications, 5109, 109-114 (1951)
14. Beerstecher, Ernest, Jr., Reed, Janet G., Brown, William Duane, and Berry, L. Joe, The Effects of Single Vitamin Deficiencies on the Consumption of Alcohol by White Rats, The University of Texas Publication, 5109, 115-138 (1951)
15. Reed, Janet G., Individual Excretion Patterns in Laboratory Rats, The University of Texas Publication, 5109, 139-143 (1951)
16. Reed, Janet G., A Study of the Alcoholic Consumption and Amino Acid Excretion Patterns of Rats of Different Inbred Strains, The University of Texas Publication, 5109, 144-149 (1951)
17. Berry, Helen Kirby, Cain, Louise and Rogers, Lorene Lane, A Study of the Urinary Excretion Patterns of Six Human Individuals, The University of Texas Publication, 5109, 150-156 (1951)
18. Berry, Helen Kirby, Further Studies on Individual Urinary and Salivary Amino Acid Patterns, The University of Texas Publication, 5109, 157-164 (1951)
19. Berry, Helen Kirby and Cain, Louise, Individual Urinary Excretion Patterns of Young Children, The University of Texas Publication, 5109, 165-172 (1951)
20. Sutton, Harry Eldon, A Further Study of Urinary Excretion Patterns in Relation to Diet, The University of Texas Publication, 5109, 173-180 (1951)
21. Brown, Jack D. and Beerstecher, Ernest, Jr., Metabolic Patterns of Underweight and Overweight Individuals, The University of Texas Publication, 5109, 181-188 (1951)

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22. Young, M. Kendall, Jr., Berry, Helen Kirby, Beerstecher, Ernest, Jr., Berry, Jim S., Metabolic Patterns of Schizophrenic and Control Groups, The University of Texas Publication, 5109, 189-197 (1951)

23. Cain, Louise, Exploration of Metabolic Patterns in Mentally Deficient Children, The University of Texas Publication, 5109, 198-205 (1951)

24. Berry, Helen Kirby, Variations in Urinary Excretion Patterns in a Texas Population, American Journal Physical Anthropology, 11, 559-576 (1953)

25. Williams, Roger J., Nutritional Vulnerability and Alcoholism, Research Reviews, July 1952

#### SCIENTIFIC PERSONNEL:

In accordance with provisions of Contract N9onr-93900, it is hereby certified that the following personnel have been employed on the contract from 15 June 1949 to 14 May 1954.

Dr. Roger J. Williams has been Technical Director without compensation from ONR during the entire period of the contract, assisted by Dr. L. L. Rogers, Research Scientist V, Biochemical Institute.

The following part-time graduate students have been employed during the contract period at the salaries and fractions of time indicated:

##### Research Scientist I

Jack D. Brown	\$115.50 per month, 1/2 time, 17 Jun 1949 - 31 May 1951
William D. Brown	\$133.50 per month, 1/2 time, 16 Sep 1953 - 14 May 1954
Gerald F. Doebbler	\$121.00 per month, 1/2 time, 1 Sep 1953 - 14 May 1954

##### Research Scientist II

Helen K. Berry	\$170.50 per month, 1/2 time, 1 Jun 1951 - 15 Jun 1953
Clara W. Kennel	\$147.00 per month, 1/2 time, 16 Jun 1953 - 15 Sep 1953

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